



Fish dependence – 2016 update

The reliance of the EU on fish from elsewhere



New Economics Foundation (NEF)

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We aim to improve quality of life by promoting innovative solutions that challenge mainstream thinking on economic, environmental and social issues. We work in partnership and put people and the planet first.

OCEAN2012 is an alliance of organisations dedicated to transforming European Fisheries Policy to stop overfishing, end destructive fishing practices and deliver fair and equitable use of healthy fish stocks.

OCEAN2012 was initiated, and is co-ordinated, by The Pew Charitable Trusts, a non-governmental organisation working to end overfishing in the world's oceans.

The steering group of OCEAN2012 consists of the Coalition for Fair Fisheries Arrangements, Ecologistas en Acción, The Fisheries Secretariat, NEF (New Economics Foundation), The Pew Charitable Trusts and Seas At Risk.



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Preface

This is the seventh annual update of the *Fish Dependence* report, first published in 2010. It includes figures for self-sufficiency levels and fish dependence days based on the latest complete information available for all EU27 member states.

This updated report includes comparisons between this year's results and results from previous reports, illustrating the extent to which the EU is dependent on fish from other regions. It also estimates how levels of self-sufficiency would vary if some European stocks were not overfished and instead restored to their maximum sustainable yield (MSY).

The fish dependence of EU member states is also calculated excluding aquaculture. This has been calculated slightly differently to previous years and is explained in more detail in the methodology section.

This report uses data from 2013, which is the latest complete dataset available. This is due to a lag in data reporting that has also been the case in previous reports. The 2015 and 2014 reports were based on 2012 and 2011 data, and the 2013 and 2012 reports were based on 2009 and 2008 data respectively. The only exception this year is aquaculture data for Lithuania, which is from 2010.

In July 2013, Croatia became the 28th Member State of the European Union.¹ However, as this report is based on 2013 data, we still refer to only EU27 member states.

The updated information is explained in the relevant sections.

We intend to continue to provide an annual update of the *Fish Dependence* report and would welcome suggestions on how to improve the content and look of this work.

Executive summary

Despite recent gains in terms of fish stock recovery, a number of European Union (EU) fish stocks remain overfished, which means they deliver less fish than if at their Maximum Sustainable Yield (MSY). Simultaneously, fish consumption throughout Europe remains high. The EU has been able to maintain high levels of consumption by sourcing fish from other regions of the world, both through the catches of its distant-water fleet and through imports. This report highlights Europe's reliance on fish products originating from external waters for its fish supplies, and provides pointers towards a more sustainable future for dwindling global fish stocks.

The New Economics Foundation (NEF) has estimated the degree of self-sufficiency in fish consumption achieved by the EU as a whole and for each of its EU27 member states; self-sufficiency is defined as the capacity of EU member states to meet demand for fish from their own waters. We have expressed the degree of self-sufficiency in the form of a 'fish dependence day'. Based on a member state's or a region's total annual fish consumption, the fish dependency day is the date in the calendar when it will start to depend on fish from elsewhere because its own supplies have been depleted.

For the EU as a whole, fish dependence day is now 13 July, indicating that almost one-half of fish consumed in the EU is sourced from non-EU waters. Last year, it was 3 July; the year before, it was 11 July. The EU has therefore maintained a high degree of reliance on fish from non-EU waters, with its fish dependence day consistently falling in early July. The EU's fish dependence is still roughly three weeks earlier than in 2000 and has only moved later in the calendar by 8 days since 2008. Whilst it is still too early to say, we hope the fact that levels of dependence are not increasing marks a change in the trend and a sign that overfishing is diminishing in EU waters. All else being equal, this would manifest itself as improving self-sufficiency. Currently, however, the level of EU self-sufficiency is still too low and the degree of overexploitation in EU waters too high.

Restoring 43 out of 150 stocks in the North-East Atlantic to their maximum sustainable yield would increase the EU's self-sufficiency levels by almost three months (87 days), moving its fish dependence day to 8 October. If directed only to human food consumption, rebuilding European stocks could provide for the annual consumption of 100 million EU citizens.

Member states with little or no access to EU waters, such as Austria, Slovakia, and Slovenia, evidently become fish dependent early in the year. More surprising, however, is that many member states with greater access to EU waters are also fish dependent early in the year. These include Spain, Portugal, Italy, Germany, and France – all of whom source more than half of their fish from non-EU waters.

Our calculations include domestic aquaculture (fish farming) in EU countries, a growing global enterprise that has served to offset the overexploitation of EU fish stocks but has not itself been responsible for reversing the trend in fish dependence that has taken place over the past years. Nonetheless, if we discount domestic aquaculture, the EU's fish dependence day moves earlier in the calendar to 27 May; for big aquaculture producers such as Spain, Italy, and Greece, their respective national fish dependence day would occur more than two months earlier. Similarly, restoring EU fish stocks would result in significant gains in self-sufficiency levels.

In a context of finite resources and growing populations, this EU model has proven unsustainable. The EU's high levels of fish dependence have implications for the sustainability of fish stocks globally, which are also overfished, and for the communities that depend on them.

The main message of this report is that rising fish consumption in a context of overexploited stocks is environmentally unviable and socially unfair. The EU has highly productive waters that have the potential to sustain a long-term and stable supply of fish, jobs, and related social and economic benefits, but only if its fish resources are managed responsibly. We have started to see some positive signs in fish stocks recovery but are still very far from where we should be.

The EU Common Fisheries Policy (CFP) was reformed in 2013 and this represents a significant step in the right direction as it lays the legal foundations to bring about the sustainable management of all fish stocks in Europe by 2020.

The reformed CFP also includes a discard ban², and requires member states to be transparent and take social and environmental criteria into account when allocating fishing opportunities. The new CFP will be supported by the new European Maritime and Fisheries Fund (EMFF), which contains some positive measures, such as more funding to enhance data collection and improve control and enforcement.

It is now up to EU member states to choose how ambitious they want to be in implementing the reformed CFP and how quickly they can deliver on the commitments of the CFP to bring fish stocks to their maximum sustainable yield (MSY) by 2020. Healthy fish stocks mean more food, jobs and profits, so the sooner we get there the better for everyone. EU member states need to look beyond the short-term costs of fish stock restoration and turn the potential long-term benefits that healthy marine resources can provide into a reality.

Results from the Bio-Economic Model of European Fisheries (BEMEF) show that rebuilding most commercial EU fish stocks in North Atlantic waters to their MSY would deliver 2,052,639 tonnes of additional fish per year, enough to meet the annual demand of 89.2 million EU citizens; €1,565 million additional gross revenues per year; and €824 million additional net profits per year which could support up to 64,092 new jobs. Additional benefits could be made by re-distributing quota under different criteria that 'historic share'.

Introduction

Fisheries play a pivotal role in human health and well-being: fish are crucial to the global food supply, providing about one-fifth of animal protein consumption worldwide.³ Indeed, fisheries are likely to become even more important as populations continue to increase and the pressures on scarce land for agriculture continue to grow, pushing more people towards fisheries as a ‘last-resort’ activity.

But there is only so much fishing that our oceans can sustain. For fisheries policies to be sustainable, they need to acknowledge and respect the ecological limits of the marine ecosystems on which they depend. Ultimately, what drives fisheries is fish consumption and that consumption needs to be commensurate with the biocapacity of the oceans.

EU waters are potentially rich and productive seas capable of delivering a long-term and stable supply of fish, together with jobs and other benefits for coastal communities. But years of overcapacity, poor compliance and failing fisheries management have contributed to the reduced seafood supply from EU waters. The EU currently consumes much more than its waters produce and depends on fish from other countries to satisfy its demand.

In a context of finite resources and a growing population, this EU model has proven to be neither sustainable nor replicable on a global scale. Unsustainable levels of fish consumption are putting pressure on EU waters, and beyond. Having overfished its own stocks, the EU is now increasing its dependence on non-EU fish to meet demand (i.e. its fish dependence). This is reducing the long-term productivity of marine ecosystems elsewhere and is also undermining the potential of poorer regions to meet their own domestic demand.

The main goal of this report is to illustrate the extent to which the EU – despite its potentially abundant and productive seas – has become increasingly dependent on fish from elsewhere. We highlight the implications of this trend for the EU and its member states and make the case for the EU to increase its self-sufficiency (i.e. when domestic supply matches domestic demand) and decrease its fish dependence through

the restoration of its own fish stocks and more responsible consumption. While fish dependence is not in itself a measure of sustainable fishing, the reduction of fish dependence over the long term is likely to indicate a move towards more sustainable fisheries management.

Arguments in favour of self-sufficiency are often misrepresented as arguments against trade and the needs of industry and the market, but that is not the aim of this report. International trade is extremely beneficial and has massive potential to improve people's lives across the world. However, it needs to take place in a fair way and within the limits of the ecosystem. The continuing and increasing reliance of the EU on fish imports is not due to a lack of natural endowment, but rather the result of mismanagement and overcapacity of EU fishing fleets which contributed to stock decline. However, as a recent EU publication shows, this trajectory is now turning around for an increasing number of stocks: "Overfishing has reduced in the European Atlantic waters, the North Sea and the Baltic Sea. For the stocks with MSY assessments, overfishing has gone down from 94% of the stocks in 2003, to 63% in 2009 and to 41% in 2012. An increasing proportion of the stocks have been assessed".⁴

In the following section we give context to our research. We summarise current trends with respect to the state of fish stocks, levels of fish consumption, and EU strategies to source fish from abroad. If fish stocks were restored (to MSY), we look at how this would affect self-sufficiency. We also assess the contribution that aquaculture makes to national self-sufficiency.

Later in the report we describe our methodology for estimating the degree of fish self-sufficiency in EU member states and share the results of our calculations. We then discuss the implications of our findings and end with a series of conclusions and recommendations.

Background

Of all assessed EU fish stocks (which is only about half), an estimated 75 per cent are overfished in the Mediterranean and 39 per cent in Atlantic European waters.⁵

Changes in fish stocks

From 1993 to 2013 EU catches steadily declined at an average rate of 2 per cent per year, with almost all demersal stocks declining. However significant progress has been made over recent years, both in terms of the number of stocks which are now fished at their Maximum Sustainable Yield (MSY) and the number of stocks which are assessed.⁶ In the EU as a whole, up to 70 percent of assessed stocks had either decreasing fishing rates or increasing stock abundance.⁷ Nonwithstanding this aggregate progress, this trend is representative only of assessed stocks. In the Mediterranean for example very few fish stocks are assessed. Many EU fish stocks are still unhealthy, producing far less than they could if they were managed in a sustainable way

On a global level, the United Nations Food and Agriculture Organization (FAO) reports that 28 per cent of stocks are overexploited or depleted, with another 61 per cent fully exploited.⁸ Only 10 per cent of stocks monitored by FAO are considered able to produce more than the current level of catches.

Overexploitation of natural resources generally implies lost 'rents', the economic benefits that could be derived from fisheries compared to current gains.⁹ The World Bank has estimated the annual cost of global overfishing at US\$50 billion, totalling US\$2 trillion over the past three decades.¹⁰ The costs of overfishing in 43 European fish stocks across the North Atlantic have recently been estimated at €3.2 billion per year (in 2010 prices);¹¹ restoring these stocks would supply enough fish to meet the current annual demand for 100 million EU citizens¹² – around 20 per cent of the EU population – therefore reducing the need to source fish from other countries.

High levels of consumption

Although the number of fish stocks which are fished at MSY in the EU have been increasing from 2 in 2003, to 13 in 2009 and up to 27 in 2012,¹³ fish consumption remains at levels beyond that which EU waters are able to support. In 2013, the total catch in EU waters amounted to nearly 5

Table 1: Fish consumption per capita for EU27 member states, 2011

Country	(kg/capita/year)
Portugal	56.8
Lithuania	43.4
Spain	42.4
Finland	35.6
France	34.6
Sweden	31
Malta	30.5
Luxembourg	29.1
Latvia	27.5
Italy	25.4
Belgium	25.1
Netherlands	23.6
Cyprus	23.3
Denmark	23
Ireland	22.3
Greece	19.6
United Kingdom	19
Estonia	14.7
Germany	14.2
Poland	12
Slovenia	11.2
Czech Republic	9.5
Slovakia	8.1
Bulgaria	6.6
Romania	6.1
Hungary	5.3
Bulgaria	4.6

Source: FAO Statistics Division (Updated: 2014).

million tonnes,¹⁴ which is about 40 per cent of the EU's total fish consumption (approximately 10 million tonnes).¹⁵ On average, each European citizen consumes 23 kg of seafood products per year (as of 2011),¹⁶ which is 24 per cent above the annual global average of 18.5 kg per capita. Portugal (56.8 kg per capita), Lithuania (43.4 kg per capita), Spain (42.4 kg per capita), Finland (35.6 kg per capita), and France (34.6 kg per capita) have the highest per capita consumption rates in the EU.¹⁷ Together, these five countries alone account for about a third of EU fish consumption.¹⁸ The FAO predicts that per capita fish consumption for EU15 countries will continue to increase by 17 per cent from 1989 to 2030, while for EU27 + Norway the FAO predicts it will rise by 9 per cent over the same period.¹⁹

Portugal has maintained its position as the biggest per capita fish consumer in the EU, steadily increasing its consumption from 29 kg per capita in 1980 to 57 kg per capita in 2011.²⁰ Most other countries have increased their per capita consumption levels as well. For example, France, Germany, Spain, Finland, Italy and the Netherlands, among others, increased their consumption by between 50% and 120% between 1961 and 2011. Others increased their consumption even faster, for example Ireland (201%), Malta (218%) and Cyprus (348%). Not all of these increases are direct human consumption but the fish may be used in aquaculture (where inputs tend to outweigh fish production outputs, particularly for carnivorous species).

At the global level, fish consumption has grown at a rate of 3.6 per cent per year since 1961, rising from 9 kg per capita per year half a century ago to 16 kg in 1997.²¹ Since 1997, this global growth has slowed;²² however, in 2009, fish consumption reached a record high

with 18.5 kg per capita, according to FAO estimates.²³ Projections suggest a global population growth of 2.4 billion, to over 9.7 billion, by 2050. Food demand is expected to rise faster than population growth, as a larger proportion of 'middle-class' people (with greater spending power) increase their animal protein consumption.²⁴ It can be expected that pressures on fish stocks are only likely to increase as the global population continues to grow.²⁵

Governments and industry also have a role to play in promoting responsible consumption. For example, the current official recommendation by the British Scientific Advisory Committee on Nutrition is to consume 280g of fish per capita per week.²⁶ If we were to meet this recommendation on a global level, the annual per capita consumption would need to surpass its current level (18.5 kg per capita) and grow by 26% to 23.3kg per capita. In a context of global overfished stocks, if aquaculture was to meet this demand alone, it would need to produce 23 million tonnes more than its production of 60 million tonnes in 2010.

Sourcing from abroad

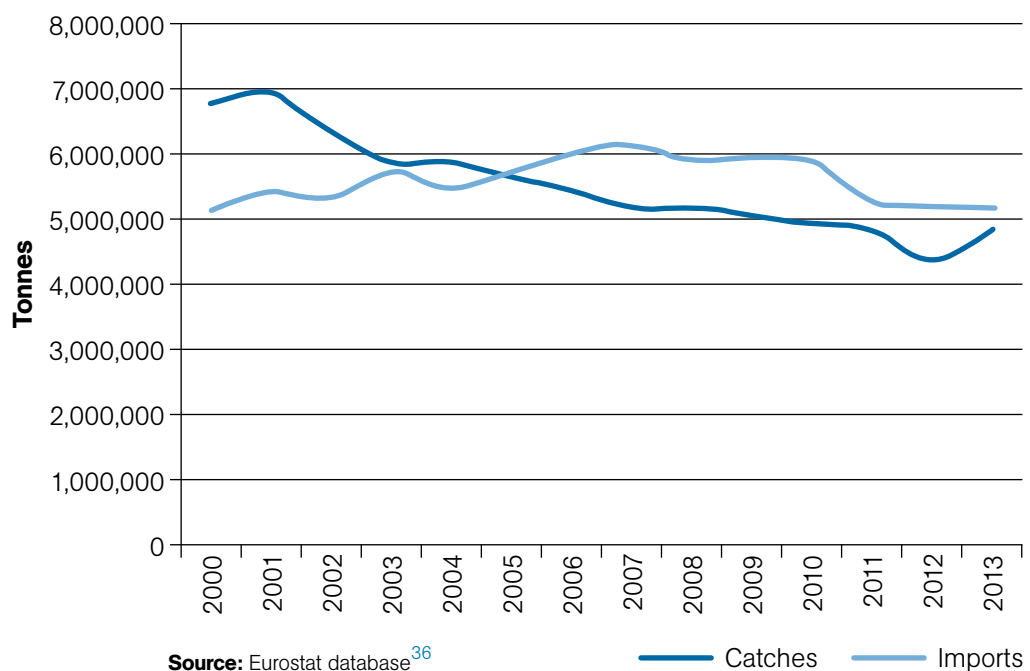
Over the years, to make up for the shortfall, the EU has increased its fish consumption by sourcing more fish from abroad. Fish is also caught by the EU's distant-water fleet, which operates in other (third) countries' and international waters. The distant-water fleet is relatively small compared to the EU's total number of vessels. In 2006, the EU had 718 vessels fishing in non-EU waters, out of a total of 88 000 vessels;²⁷ yet this small number makes up almost one-quarter of the EU fishing capacity in tonnage. Spain accounted for over one-half of these vessels; most of the others are from France, Portugal, Italy, Latvia, Lithuania, and the Netherlands, which owns some of the largest freezer-trawlers.^{28,29} Over the 2001–2005 period, estimates of the catch size of the EU distant-water fleet ranged from 1.06 million to 1.2 million tonnes,³⁰ equivalent to 19–21 per cent of total EU catches.³¹ These vessels predominantly operate in third countries' exclusive economic zones (EEZs), under fisheries partnership agreements, and in international waters, yet their catch is classed as EU produce.

The EU is the world's largest market for fish and has become increasingly reliant on imports to meet its needs.³² Between 2000 and 2013, it has, on average, imported 3.8 million tonnes more fisheries products than it has exported (Appendix: Table A1).³³ These imports help meet its demand for human consumption and processing, as well as animal feed and aquaculture. Data from the EU indicates that imports in tonnes accounted for between fifty per cent in 2006 and 60 per cent in 2012³⁴ of the EU's apparent consumption.³⁵ The trends in catches and imports are illustrated in Figure 1.

Aquaculture production

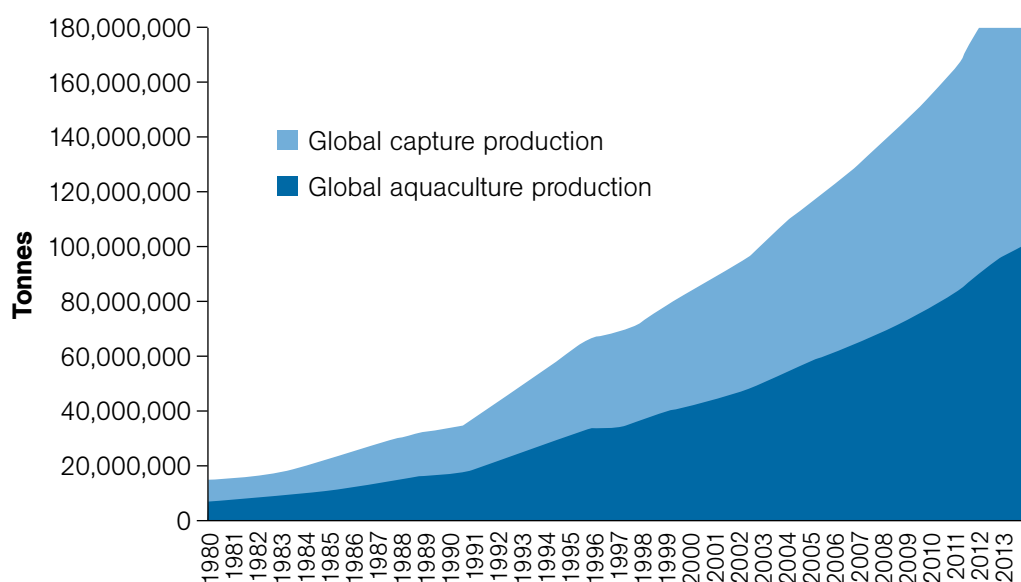
Aquaculture is often presented as a solution to overfishing, as a means of increasing production in a way that is decoupled from wild stocks. As global fish stocks have declined, aquaculture production has risen and it

Figure 1: EU27 catches and imports, 2000–2013 (tonnes live weight)



is now the world's fastest growing animal food sector.³⁷ In 2010, global total catch was 89 million tonnes; aquaculture production (not including plants and products not bred for human consumption) totalled 60 million tonnes, with a value of US\$ 119 billion. Aquaculture's global contribution to human consumption of fish products was 47 per cent in 2010 compared with only 9 per cent in 1980.³⁸ Average annual per capita consumption of aquaculture products has increased more than tenfold since 1970 – to 8.7kg in 2010, at an average rate of 7.1% per year.³⁹ Therefore, aquaculture now represents a highly significant component of global fish consumption.

Figure 2: Global catches and aquaculture, 1980–2013



Source: FAO Fishery Statistical Collections⁴¹

Figure 3: EU27 catches and aquaculture, 2000–2013

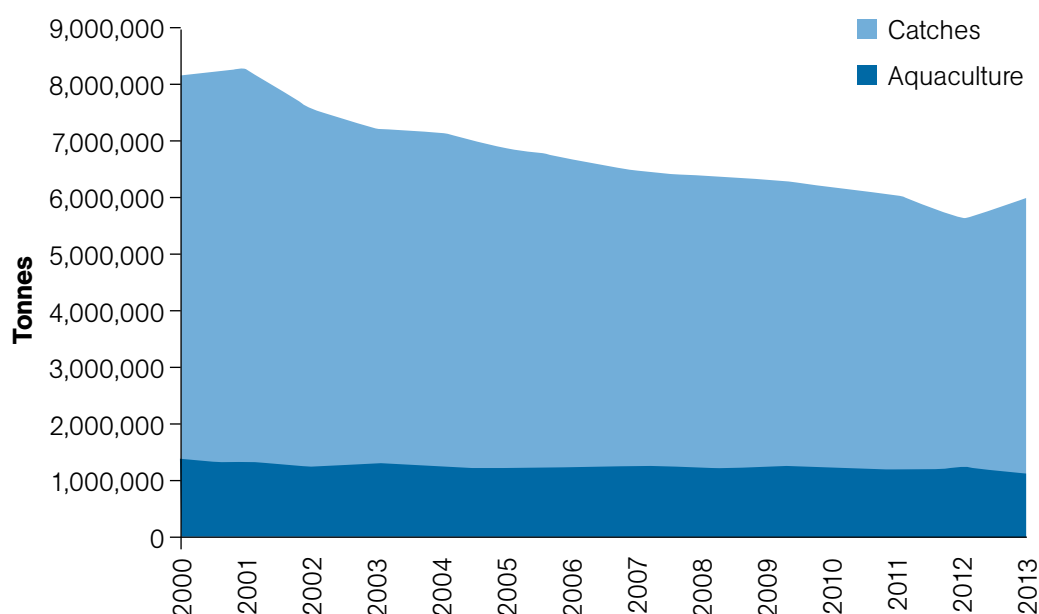
Source: Eurostat database⁴¹

Figure 2 illustrates the growth of the aquaculture sector globally; highlighting the trend of the industry to overtake landed catch volumes in the near future and potentially become the most important global source of fish and seafood.⁴²

In the EU, aquaculture production increased up to 1997 as wild catches declined; since then, however, domestic aquaculture production has remained stable at around 1.16–1.43 million tonnes.⁴³ Domestic EU aquaculture supplies less than 11 per cent of fish consumed in the EU.⁴⁴

Almost 90 per cent of EU27 production, takes place in EU15 countries, with five nations (Spain, France, the UK, Italy, and Greece) supplying 75 per cent of production.⁴⁵ Table 2 shows the EU's aquaculture production in 2013.

Table 2: EU domestic aquaculture production (2013) in quantity and as EU share

	2013 aquaculture production	
	Total production (tonnes)	% of EU27 production
EU27	1,167,123	100%
Spain	226,253	19%
United Kingdom	206,000	18%
France	196,385	17%
Italy	140,911	12%
Greece	110,662	9%
Netherlands	46,605	4%

Note: Figures rounded. Source: Eurostat Statistics Database⁴⁶ and Eurostat Pocketbook⁴⁷

The aquaculture industry and some policymakers hope that increases in aquaculture production will compensate for the decline in wild fish catches.⁴⁸ But, while there is likely to be an increasingly important role for aquaculture, there are a few reasons why its potential is limited. First and foremost among these is that some forms of aquaculture perform a dual role of producers and consumers of fish, putting extra pressure on already overfished stocks; they are dependent on fresh fish or fish meal and oil produced by wild fish catches to feed many of its farmed species, most notably carnivorous fish such as salmon or sea bass.

In 2013, about 16 per cent (15 million tonnes) of global fish production was used to make fish meal and fish oil, primarily for aquaculture.⁴⁹ Although fish meal and fish oil global production from marine capture fisheries has not increased significantly between 1980 and 2009, the share of this market going to the aquaculture sector has increased considerably from 10 per cent in 1980 to 63 per cent in 2009.⁵⁰

More than 46 per cent of the global aquaculture production in 2008 depended upon the supply of external feed inputs.⁵¹ The percentage of species non-reliant on external feed has declined gradually from more than 50 per cent in 1980 to 33.3 per cent in 2010, reflecting increasing consumer demand for species of fish that are higher up the food chain, such as salmon and tuna.⁵²

Asia accounted for 88 per cent of global aquaculture production by volume in 2013.⁵³ But, as the world's largest market for fish, the EU is an important player in ensuring the sustainable management of the aquaculture industry. FAO statistics on the international trade in fish products do not distinguish between fisheries and aquaculture,



therefore it is difficult to determine aquaculture's share of global trade. However, estimates for China made in 2006 suggest that 39 per cent of the production volume and 49 per cent of the production value of China's aquaculture production was exported.⁵⁴ Therefore, while the EU's domestic aquaculture sector may not be growing significantly, domestic consumption is clearly dependent on high levels of aquaculture from other nations.

Furthermore, in the EU aquaculture sector, species dependent on external feed input still make up 43 per cent of the production volume and 62 per cent of its value. The Rainbow trout (21%), the Atlantic salmon (16%) and the Gilthead seabream (12%) alone make up nearly half of EU's aquaculture production by value.⁵⁵

With current practices, production of such species puts great pressure on wild fish stocks. Indeed, the Department of Environment, Food and Rural Affairs (Defra⁵⁶), the UK government's agricultural and environmental ministry, has stated that an increased reliance on these groups of species is unviable and instead points to species that are lower in the food chain such as molluscs.⁵⁷

If the direction of aquaculture is determined by consumption behaviour, with a preference for carnivorous and resource-intensive fish, then aquaculture will drive the depletion of fish stocks even further. Consequently, the only viable means of offsetting depleted fish stocks and maintaining the same quantity of supply is to increase the production of seafood, such as molluscs and crustaceans, effectively replacing wild fish with farmed molluscs. EU aquaculture appears to be following this scenario. With EU waters providing fewer fish, half of EU's aquaculture production is now of shellfish (molluscs and crustaceans).⁵⁸

At the same time, up to 75 per cent of the fish meal in the feed for predator species could easily be replaced.⁵⁹ Over the last 30 years, there have been successes in the substitution of the proteins in fish meal with vegetable proteins or with proteins from micro-organisms.⁶⁰ Fish waste from the processing industry is also increasingly being used in the production of feed, making up about 36 per cent of the world's production of fishmeal in 2010;⁶¹ bycatch is the primary source of fresh aquaculture feed in Asia.⁶² However, these alternative sources for fish meal and oil still raise a number of concerns, including the effects of a vegetarian diet on fish health⁶³ and the use of bycatch potentially leading to a softening of regulations on reducing bycatch.⁶⁴ The use of discards and bycatch for aquaculture feeds and the development of markets around them could create a barrier to preventing unwanted catches in the first place.

Another reason why finfish aquaculture's potential may be limited is its links to a wide range of environmental impacts.^{65, 66} These include the introduction of alien species;⁶⁷ environmental impacts from genetically modified and escaped fish;^{68, 69, 70} habitat modification and pollution;⁷¹ antibiotic use and other problems with intensive farming practices;⁷² and an unsustainable use of resources.⁷³

Finally, EU aquaculture's prioritisation of more resource-efficient groups, such as molluscs, will do little to satisfy the diversity of fish products often demanded by consumers.

In conclusion, aquaculture, if undertaken responsibly, can add to the global supply of fish and therefore, it can reduce pressure on wild fish stocks. However, the industry is still significantly adding to consumption levels, as is the case with carnivorous species. Without an improvement in the abundance of wild fish stocks, aquaculture's potential for growth is predominantly in resource-efficient, non-carnivorous species. This business-as-usual approach will see the continued depletion of wild fish stocks and – as is already being seen – the eventual replacement for consumption purposes of wild fish with farmed molluscs and crustaceans.

Methodology

In order to reveal the EU's dependence on fish from non-EU waters, we have estimated self-sufficiency levels for all EU countries. We express these in terms of fish dependence days.

Self-sufficiency levels are calculated as a ratio of domestic supply (production) over domestic demand (consumption):

$$\text{self-sufficiency} = \text{domestic supply} / \text{domestic demand}$$

A country that is able to produce as much as it consumes will have a ratio of 1.00 or more. A ratio of less than 1.00 means that some consumption depends on non-EU resources, which can be interpreted as an indicator of dependence on the resources of other countries. Taken over several years, such ratios allow us to identify trends in the EU's dependence on other nations' resources. Therefore, both the degree of self-sufficiency and the changes in the ratio over time are important. A decreasing ratio means that more consumption is being supplied from outside the EU; an increasing ratio means that the EU is becoming more self-sufficient.

The self-sufficiency of a country increases if domestic production increases, net imports decrease, and/or if consumption decreases (decreasing consumption would be observed through lower production and/or lower net imports). Increases in production can come from higher catches in national and EU waters and/or from higher aquaculture production.

The degree of self-sufficiency can be represented as a fraction of a year and then converted into a fish dependence day: the day in a year when a country will have consumed its entire annual supply of fish resources if it uses only production from its own waters from the beginning of the year. After this date the nation becomes dependent on sourcing its products from elsewhere, hence the date is termed the 'fish dependence day'.

For example, a degree of self-sufficiency of 0.4 means that a member state's fish resources provide the equivalent of 146 days of consumption (365 days x 0.4). Counting 146 days from 1 January, we can say that a country with a self-sufficiency ratio of 0.4 depends on other countries' resources from 26 May onward for the rest of the year. Therefore, the earlier the date, the more dependent the member state.

In order to obtain fish dependence days for all EU member states, we took the following steps.

- i) Domestic supply: we calculated domestic supply by gathering data on total catch per nation in EU waters and trade balances.
- ii) Domestic demand: we calculated domestic demand by gathering data on total catch in all regions and trade balances, i.e. exports minus imports.
- iii) Self-sufficiency: we calculated the degree of self-sufficiency as the ratio of domestic supply over domestic demand.
- iv) Fish dependence days: we converted the degree of self-sufficiency into calendar days by multiplying by 365 and finding the corresponding fish dependence day in the calendar year.

i) Domestic supply

Domestic supply is defined as catches in EU waters plus aquaculture production. At national level this includes catches by the national fleet in its own national waters and the waters of other EU member states, plus all domestic aquaculture production (mariculture, freshwater aquaculture, and any other form). Catches by EU vessels in non-EU waters are excluded, since these depend on non-EU resources.

In equation form, domestic supply is calculated as:

$$\text{domestic supply} = \text{catches in national and EU waters}^{74} + \text{aquaculture production}.$$

Data for catches⁷⁵ from the EU and member states were available through Eurostat⁷⁶ (see Appendix: Table A1 for sample statistics). For four Member States (Austria, Czech Republic, Hungary and Slovakia) there was no catch data available for 2011 so we assumed that 2011 catch was equal to 2010 catch. These nations are all landlocked and have very low catch tonnages. It was not possible to obtain data on catches by member states disaggregated by the source location, i.e. whether the fish were sourced from national and EU waters or non-EU fishing grounds. We therefore used an alternative estimate of domestic supply as:

$$\text{domestic supply} = \text{fish production (total catches in all waters + aquaculture)} - \text{catches in non-EU waters}$$

In the absence of data on non-EU catches by member states, the catch by a member state was estimated using one of two methods.

The first estimate of non-EU catches was that obtained from catches in FAO areas around the world by each country, with the exclusion criteria of any overlap with EU waters. This involved extracting data from Eurostat on catches by the EU and its member states for FAO fishing areas throughout the globe, then looking at which of these areas were outside the EU's

EEZ. Where there was not a perfect overlap between the EU's EEZ and an FAO sub-division, we conservatively assumed all catches were made in the EU EEZ (conservative, because a lower external catch means higher self-sufficiency).

The second estimate of non-EU catch was calculated using fleet tonnage capacity as a proxy for the share that a country had in total EU27 external fishing, both of which were provided in a European Commission report.⁷⁷ This approach used a share of gross tonnage that each nation has in the total EU external fleet⁷⁸ and the assumption that the gross tonnage for all member states translates into proportional shares of catches (Appendix: Table A2 presents data on the tonnage of member states' external fleets and the EU as a whole). For example, if a member state had 10 per cent of the EU's external fleet capacity in terms of gross tonnage, we assumed that it was responsible for 10 per cent of the catch in non-EU waters.

Therefore, using this approach, catches in non-EU waters for each member state (MS) were calculated as:

$$\text{catches in non-EU waters by MS fleet} = \text{catches in non-EU waters by EU fleet} \times \text{MS share of EU tonnage capacity}$$

A combination of these two methods was applied to all countries, with the condition that the maximum estimate was used. The exception is the case of Spain, for which the first method produced an estimate that was not considered reasonable. The second method was used in this case.

Our estimate for the 2006 total non-EU catch was derived from a simple average of the previous five years' external catch: 1 198 847 tonnes (varying from 1.06–1.30 million tonnes).

Our estimate for the 2007 total non-EU catch was taken as a fixed 21 per cent of the total EU catch in that year, derived from a conservative estimate from a European Commission report.^{79,80} This equals approximately 1.08 million tonnes.

Our estimate for the 2009, 2010, 2011, 2012 and 2013 total non-EU catches were also a fixed 21 per cent of the total EU catch, derived as above.

ii) Domestic demand

Domestic demand is defined by apparent consumption within a country. It encompasses all demand for fish products by a country, whether these are used for human consumption or animal feed, or are wasted. Apparent consumption is measured as total production (catches and aquaculture), plus imports, minus exports. In equation form that is:

$$\text{apparent consumption}^{81} = \text{total production (total catches in EU and non-EU waters + aquaculture)} + \text{imports} - \text{exports}$$

Data for catches for the EU and member states – the same as was used for domestic production – were taken from Eurostat statistics⁸² (see Appendix:

Table A1 for sample data). Our trade data were taken from Eurostat international trade database⁸³ (see Appendix: Table A3 for sample data). These trade data cover trade in all fish and aquaculture products.

iii) Self-sufficiency

The degree of self-sufficiency was calculated by dividing domestic supply by domestic demand. As noted earlier, this represents the proportion of consumption in a region (the EU) or nation (EU member state) that is supplied by its own resources. In equation form, this is calculated as:

$$\text{self-sufficiency} = \text{domestic supply} / \text{domestic demand}.$$

This is equivalent to:

$$\text{self-sufficiency} = \text{catches in EU waters} + \text{aquaculture production} / \text{apparent consumption}.$$

Net trade (imports minus exports) is included in the domestic demand denominator and not in domestic supply because trade is not production. A positive trade balance (i.e. exports greater than imports) increases the degree of self-sufficiency by reducing the proportion of production that is consumed domestically, and therefore should be included in domestic demand.

iv) Fish dependence days

The final step of the methodology was to convert self-sufficiency ratios into days. This was done simply by multiplying the self-sufficiency fraction by 365 and deriving the corresponding date in the year.

iv) Fish dependence day without aquaculture

We calculate the date at which member states would become fish dependent if they could not rely on aquaculture to sustain consumption. We subtract aquaculture from domestic production and divide this by apparent consumption (which is assumed not to change); this implies that aquaculture would have to be replaced by imports in order to sustain the same level of consumption.

This is slightly different to the way we have calculated the measure in previous versions of this report. Previously we have subtracted aquaculture from both domestic production and consumption, thereby assuming that consumption adjusts so that no additional imports are necessary.

We have made this change in order to demonstrate the maximum impact of aquaculture on fish dependence.

iv) Fish dependence day without overfishing

We calculate the fish dependence day without overfishing by adding estimates of catch lost due to overfishing for each Member State to the estimates of production. More detail on this can be found in the Results section.

Caveats with data and methodology

While all data used in our estimates were taken from official sources such as the FAO, Eurostat, and the European Commission, the datasets used had several limitations that could have affected our results. A key point to highlight is that while all results have derived from official data sources, our calculations have been restricted at times by the limited quality and availability of data. Additional information on the share of national catches derived from national, EU, international and other non-EU waters, would help strengthen our results, but this information is either unavailable or difficult to access. This is partly due to poor reporting of fisheries data and a lack of transparency among EU member states. While our results are not perfect, they are based on the best available information. As explained in the following sections, our estimates are conservative, which means that real levels of self-sufficiency are likely to be lower than the results show.

i) Sustainability

Care must be taken when interpreting changes in fish dependence days from one year to another. In particular, an increase in self-sufficiency in one year (and therefore a later fish dependence day) does not necessarily indicate an increase in stock size or greater sustainability. Self-sufficiency may increase in a single year if a large but unsustainable catch is harvested since it increases domestic production temporarily. Equally, a decreasing self-sufficiency (earlier fish dependence day) may indicate a harvest that has been restrained in order to restore fish stocks to more sustainable levels. For these reasons longer term trends may be more indicative of genuine changes in sustainability.

ii) International waters

Some fishing grounds are not located in the exclusive economic zones (EEZs) of any nation. Thus, the total sum of fishing grounds within EEZs is less than the total global fishing resources. Since these resources do not belong to any nation, they cannot be counted as a component of self-sufficiency for any nation and we do not take these into account, though some portion of international fishing grounds might arguably be considered to pertain to the EU.

iii) Member state catches in EU waters

The Rule of Origin⁸⁴ criteria dictates that fish caught by an EU vessel outside EU waters be classified as EU produce, unlike produce caught in the same location under another vessel's flag. This means that all EU catches by the EU fleet in non-EU waters are classified as EU production, even if they come from other countries' waters. This makes it difficult to distinguish between what is caught in a country's own territorial waters (defined as a country's EEZ) and catches in other member states' EEZs or EU waters.

The absence of official data that divides catches between national waters, EU waters, international waters, and non-EU waters led us to make several assumptions that could affect the results at member state level.

iv) EU catches in non-EU waters

Catches by the EU's external fishing fleet in our estimates should be considered the minimum amount of fish caught by EU vessels in non-EU waters.

The total non-EU catch by the EU external fleet and its gross tonnage is based on the 718 vessels of the EU external fleet that conduct at least 90 per cent of their activity outside EU waters. For example, in the Mediterranean the EEZ only extends to 12 nautical miles from the coast, which means that vessels fishing beyond this limit are fishing in international waters. But it is unlikely that the 718 vessels composing the external fleet include those vessels operating in the Mediterranean, particularly since these 718 vessels must spend at least 90 per cent of their activity outside the EU. Where vessels from Mediterranean EU countries operate beyond their EEZ for less than 90 per cent of their activity, their catch is counted as national catch when it should be regarded as sourced from non-EU waters.

This suggests that the total amount of non-EU catches is much larger than the figures on which we have based our results.

v) Share of national catch sourced from non-EU waters

As already described, estimating non-EU catch involved a number of methods. The third one was based on the assumption that every country's share of EU external fleet capacity (in gross tonnage) is a reflection of its share of non-EU catches. A country that makes up 2 per cent of the EU external fishing fleet tonnage capacity would, we assume, be responsible for 2 per cent of total catches by the EU external fishing fleet (equivalent to 21 293 tonnes). This quantity was then subtracted from the total catches by that country to obtain its catches in EU waters.

Using capacity as a proxy for catch-size appropriation is equivalent to assuming that all vessels catch the same amount relative to their tonnage. This could result in underestimated attribution of the share of external catches commanded by countries with low-capacity vessels, relative to the average, as well as overestimates for those countries with above-average capacity vessels. Also, it does not take any transshipment (i.e. shipping to intermediate destinations) into consideration.

vi) Lack of data on catches within the EEZs of member states

Under the CFP, EU waters are regarded as a common resource that can be exploited by any member state. Without data on catches within a member state's own waters we cannot comment on how self-sufficient a member state is within its own EEZ. This means that fishing by member states in other nations' waters will increase their self-sufficiency as long as these waters are inside the EU. Spain is clearly a significant beneficiary of this since a large part of its fleet operates in waters outside Spanish jurisdiction but still within EU waters. This does not, however, affect the self-sufficiency of the EU as a whole.

vii) Illegal, unreported, and unregulated (IUU) fishing and bycatch

Our results do not take into account IUU fishing, discards, and bycatch. Estimates of the scale of IUU fishing are only available for specific stocks or fleets, making it impossible to include it in this analysis. However, high levels of discards and bycatch should have little impact on the analysis as all discards and most bycatch do not enter the market. Yet, it is worth noting that official data sources on total catches are estimated from recorded landings and, given that landings do not include bycatch or discards, the catch data used in our analysis underestimate the true catch that takes place, further supporting our assertion that our results are conservative.

viii) Trade data

Data on trade are readily available from the Eurostat pocketbook on fisheries statistics 1990–2006,⁸⁵ but unfortunately this information is no longer published. Instead, all trade data for 2013 have been extracted from the Eurostat external trade database.⁸⁶ Trade codes include all seafood products, including live fish, frozen fish, fishmeal, fish oils, and processed fish, and are exactly the same as those used by Eurostat in previous editions of the fisheries statistics pocketbook.

ix) Aquaculture trade

When constructing the self-sufficiency dates that exclude aquaculture from the catch data, we were unable to remove trade in aquaculture products. This was because of a lack of trade data sufficiently detailed to distinguish at the 10-digit-code specificity required at EU level. This is something that could be further explored in future editions of this report, but it would require updating dates for all previous years if we wanted to make them comparable.

x) Aquaculture

The formula used to estimate self-sufficiency levels includes aquaculture as a measure of domestic production. Higher levels of aquaculture production will increase self-sufficiency if it contributes to a net gain in seafood produced. This is limited, however, if aquaculture is dependent on more fish than it produces.

The dependence of aquaculture on wild fish stocks is already captured in the wild catches and trade components of the formula. However, our methodology does not capture the fact that now half of the EU's domestic aquaculture production is of shellfish (molluscs and crustaceans)⁸⁷ and that the current trend is one in which we are replacing wild fish with farmed molluscs. Neither does it capture the diminished choices available to the consumer.

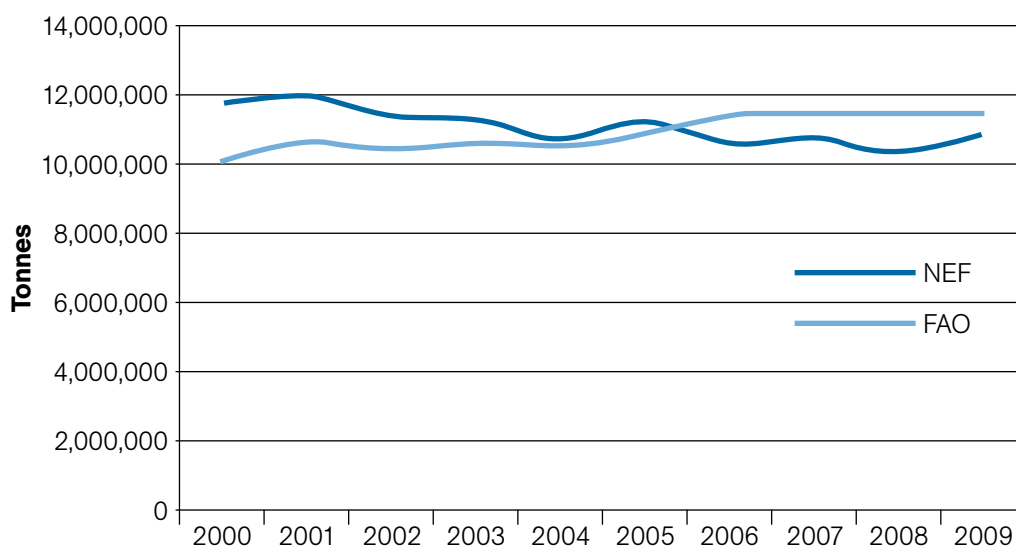
In other words, if we depleted all wild fish stocks and replaced them with the equivalent quantity of farmed molluscs, self-sufficiency levels would remain the same. Similarly, if we replaced 200 species of wild fish with just one species of farmed mollusc, as long as the aggregate quantities of fish – seafood – produced remained the same, the self-sufficiency level would not change.

Consequently, we present the results with and without aquaculture production. Removing aquaculture production from the equation results in a decrease in self-sufficiency (i.e. fish dependence will come earlier in the year) as shown in Table 6. That said, due to the way in which trade data are collected, aquaculture could not be removed from trade data, which means that each tonne of traded fish product is equivalent, regardless of whether it is wild or farmed.

xii) Apparent Consumption

We calculate the consumption levels of EU economies by a 'disappearance model'. In other words we assume that the amount of fish consumed is equal to the total weight of fish entering the economy (catches and imports), less any fish that exits the economy (exports). This does not give 'human consumption', since fish could be wasted or used for some other purpose (e.g. animal feed). The UN FAO also calculates consumption according to a disappearance model. However, they calculate a measure that is considered closer to actual human consumption. Therefore, in addition to catches and trade, they also take into account changes in inventories of fish products, direct feed uses and other non-food uses. While this trend is also revealing, for the purpose of total fish dependence we argue that total fish consumption, rather than human consumption, is the relevant measure. Figure 4 below compares our measure of apparent consumption with that calculated by the FAO.

Figure 4: Comparison of FAO and NEF measures of apparent consumption



Source: FAO Statistics Division (<http://faostat.fao.org/site/610/default.aspx#anchor>) and NEF's calculations.

Results

When analysing the ratio of domestic supply over domestic demand, we arrived at estimates of the degree of self-sufficiency of the EU and its member states (Table 4) and their corresponding fish dependence days (Table 5).

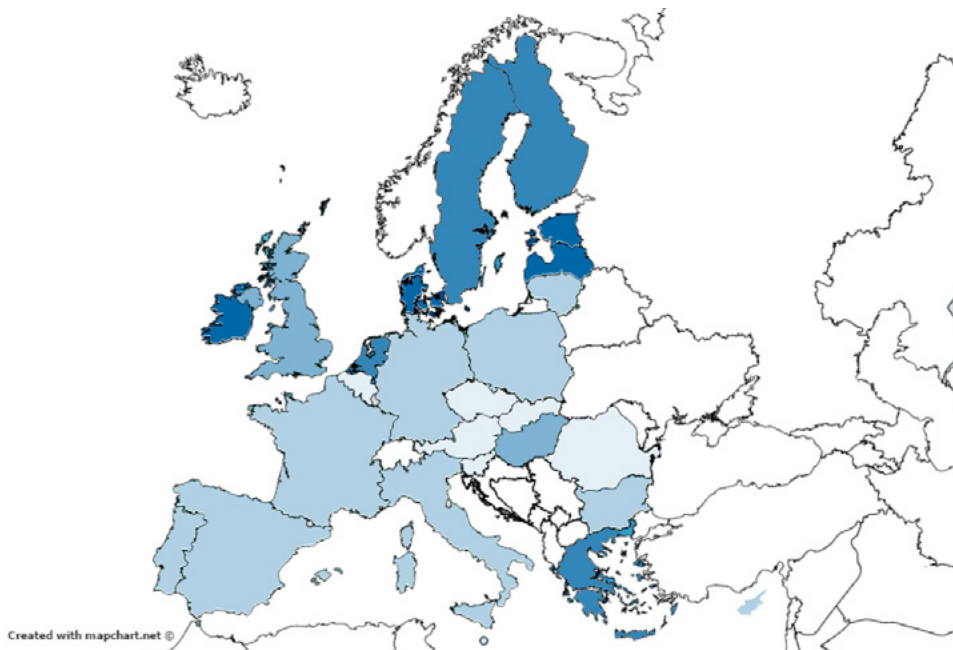
Table 4 shows that the EU's degree of self-sufficiency is around 53 per cent in 2013, with a slight improvement on the previous year.

Table 4: Degree of self-sufficiency for the EU and its member states

	1990	1995	2000	2005	2006	2007	2008	2009	2010	2011	2012	2013
EU27		0.871	0.59	0.563	0.518	0.5	0.512	0.511	0.518	0.52	0.51	0.53
Austria	0.057	0.057	0.061	0.039	0.041	0.039	0.035	0.036	0.036	0.04	0.04	0.05
Belgium*	-	-	0.161	0.215	0.287	0.206	0.165	0.137	0.133	0.13	0.13	0.15
Bulgaria	-	-	0.401	0.234	0.267	0.402	0.337	0.378	0.438	0.46	0.44	0.51
Cyprus	-	-	0.819	0.137	0.264	0.228	0.19	0.198	0.22	0.35	0.36	0.44
Czech Republic	-	-	0.314	0.313	0.353	0.326	0.308	0.306	0.351	0.36	0.34	0.40
Denmark	1.125	1.197	0.999	0.85	0.787	0.618	0.75	0.835	0.713	0.99	1.14	1.22
Estonia	-	-	1.106	7.072	30.835	2.505	2.417	4.214	2.923	2.18#	1.64	1.72
Finland	0.603	0.643	0.7	0.669	0.679	0.745	0.785	0.804	0.782	0.81	0.85	0.86
France	0.679	0.565	0.564	0.466	0.468	0.449	0.439	0.386	0.375	0.38	0.40	0.41
Germany	0.328	0.295	0.28	0.421	0.341	0.32	0.302	0.271	0.265	0.26	0.27	0.33
Greece	0.635	0.676	0.66	0.597	0.657	0.598	0.583	0.602	0.679	0.94	0.97	0.99
Hungary	-	-	0.332	0.379	0.482	0.513	0.502	0.499	0.539	0.52	0.55	0.60
Ireland	2.431	2.197	1.876	1.916	1.776	1.536	1.813	1.453	1.554	1.99	2.17	2.64
Italy	0.491	0.472	0.393	0.34	0.343	0.329	0.291	0.302	0.284	0.28	0.30	0.25
Latvia	-	-	1.094	1.442	1.437	1.339	1.285	1.128	1.19	0.66	1.45	0.98
Lithuania	-	-	-0.444	0.244	0.233	0.446	0.385	0.392	0.249	0.15	0.25	0.17
Malta	-	-	-	-	-	-	0.253	0.022	0.335	0.42	0.41	0.39
Netherlands	1.602	0.887	1.022	1.716	1.681	1.213	1.071	0.562	0.814	0.62	0.85	0.99
Poland	-	-	0.529	0.494	0.467	0.545	0.429	0.545	0.428	0.36	0.40	0.40
Portugal	0.516	0.383	0.205	0.112	0.318	0.317	0.303	0.244	0.325	0.33	0.32	0.30
Romania	-	-	0.237	0.122	0.138	0.16	0.148	0.146	0.076	0.12	0.13	0.14
Slovakia	-	-	0.072	0.095	0.102	0.121	0.1	0.106	0.073	0.02	0.02	0.10
Slovenia	-	-	0.207	0.177	0.155	0.159	0.142	0.177	0.117	0.15	0.12	0.10
Spain	0.461	0.397	0.404	0.343	0.356	0.349	0.37	0.397	0.371	0.44	0.36	0.36
Sweden	0.862	1.053	1.402	1.096	1.35	0.995	1.02	1.096	1.278	0.91	0.82	0.91
UK	0.577	0.674	0.636	0.643	0.592	0.538	0.595	0.638	0.7	0.7	0.70	0.72

Notes: *Includes Luxembourg. # Consumption for Estonia in 2013 was calculated as 2013 population multiplied by the estimate of per-capita consumption from the FAO Fishery and Aquaculture Statistics Yearbook 2010. This approach was used because under the normal methodology the consumption estimate was unrealistic - indicates that estimates could not be made, typically due to lack of data, particularly trade balances.

Figure 5: Map of the degree of self-sufficiency in EU Member States in 2013



Note: The darker the shading the more self-sufficient a country is.

Fish dependence in the EU, as a whole, shows that its fish stocks still support just under one-half of its consumption.

For the past five years, the EU's fish dependence day has occurred in early July. Based on 2013 data, it currently falls on 13 July, only eight days later than in 2012. Member states differ in their levels of self-sufficiency and the majority of EU countries have somewhat increased their fish dependence in 2011. Unsurprisingly, inland countries or those with little access to the sea (i.e. Austria, Slovenia, Slovakia, Romania, and the Czech Republic) become fish dependent much earlier in the year, relative to the EU average. Only Estonia and Ireland appear to remain self-sufficient and able to produce more fish than they consume, with Ireland improving its self-sufficiency by about 5 months compared to the previous year.

On the other hand, Latvia has gone from self-sufficient in 2012 to fish dependent in 2013. Latvia now becomes fish dependent in the end of December. This almost 4 months' change in Latvia's fish dependence day was due to a reduction of its trade surplus.

While the degree of self-sufficiency is important because it reflects the current state of affairs, trends are also important because they reflect the longer-term implications. We see that most countries and the EU as a whole remain increasingly dependent on resources from outside EU waters. The EU27 member states have reduced their degree of self-sufficiency by 41 per cent compared to 1995.

There are signs of increasing dependence for several countries. In 2013, Italy for example has increased its dependence by 15 days compared to 2012, while Portugal and Slovenia also increase their dependency by seven and six days respectively.

The Netherlands has remained dependent on non-EU fish for the fifth consecutive year since the 1990s, but it has nonetheless experienced a notable improvement in 2013, as its fish dependence was reduced by virtually one and a half month compared to 2012: it is almost self-sufficient in 2013. It is worth noting however, that the wide ranging figures for the Netherlands over the past three years are most likely to relate to the quality of the data or changes in records of imports and exports figures, rather than to changes in consumption or fishing patterns.

Some countries have access to potentially enormously productive waters, yet their dependence does not seem to reflect this, due mostly to the state of their fisheries and their levels of consumption. In fact, many become fish dependent in the first half of the year: Portugal becomes dependent on 20 April; Spain on 10 May; France on 30 May; Italy on 3 April; others like the UK come a bit later in the year on 19 September.

In ten years the EU27 fish dependence day has moved earlier in the year by almost three weeks– from 4 August in 2000 to 13 July in 2013. At current levels of consumption, if EU citizens were to rely solely on fish caught in EU waters, the EU would consume its domestic supply by 13 July. Although this shows a three-day improvement compared to the previous year, the move is not significant enough to reverse the dependency trend and the EU still depends on fish from other parts of the world for almost half of the year.

However, there are also signs of increasing self-sufficiency. Between 2012 and 2013, Sweden has moved its day to later in the year by almost a month, due to a reduction in its imports and an increase in its production. Finland and Cyprus have increased its self-sufficiency by more than two months over the last decade. Greece's significant reduction of imports has translated into its self-sufficiency increasing by more six months since 2008. An increase in self-sufficiency in 2013 compared to 2012 can be seen for the Netherlands (55 days) and Germany (25 days).

Excluding aquaculture from domestic production further reduces the degree of self-sufficiency, as can be seen in Table 6. Removing aquaculture from production makes the trend of declining self-sufficiency more apparent, moving the EU fish dependence day earlier in the year by more than a month, in the period 2000–2011, and between one and seven months for the main EU aquaculture producers such as Spain (two months), Italy (1.5 months), France (1.5 months), and Greece (more than seven months). Note that the methodology for calculating the fish dependence day without aquaculture has slightly changed since the last update of this report – see the methodology section for more details.

The impacts of overfishing are highly significant in diminishing the long-term catches that can be sustained by European fleets. A recent paper by NEF⁸⁸ found that overfishing in 43 North East Atlantic stocks amounted to an annual loss of 3.5 million tonnes of fish in 2010 for all countries (mostly the EU27, Norway, and Iceland), equivalent to €3.2 billion. Importantly, the study does not look at Mediterranean stocks or any of the more than 100 other stocks in European waters, meaning that the estimated costs of overfishing are not exhaustive and are likely to be much higher.

The 3.5 million tonnes lost were calculated using a static comparison of the MSY that could be taken from each of these stocks compared to their current, overfishing-reduced landings in 2011.

Table 5: Fish dependence days for the EU and its member states

	1990	1995	2000	2005	2006	2007	2008	2009	2010	2011	2012	2013
EU27	-	-	04-Aug	25-Jul	09-Jul	02-Jul	05-Jul	06-Jul	08-Jul	11-Jul	05-Jul	13-Jul
Austria	21-Jan	21-Jan	23-Jan	15-Jan	15-Jan	15-Jan	13-Jan	14-Jan	14-Jan	17-Jan	16-Jan	19-Jan
Belgium*	-	-	28-Feb	20-Mar	15-Apr	17-Mar	01-Mar	19-Feb	18-Feb	16-Feb	15-Feb	23-Feb
Bulgaria	-	-	27-May	27-Mar	08-Apr	27-May	02-May	18-May	09-Jun	16-Jun	09-Jun	05-Jul
Cyprus	-	-	27-Oct	19-Feb	07-Apr	25-Mar	10-Mar	14-Mar	22-Mar	07-May	10-May	10-Jun
Czech Republic	-	-	25-Apr	25-Apr	09-May	30-Apr	22-Apr	22-Apr	09-May	13-May	02-May	26-May
Denmark	> year	> year	31-Dec	07-Nov	15-Oct	14-Aug	30-Sep	01-Nov	18-Sep	29-Dec	> year	> year
Estonia	-	-	> year	> year	> year	> year	> year	> year	> year	> year#	> year	> year
Finland	09-Aug	23-Aug	13-Sep	02-Sep	05-Sep	29-Sep	13-Oct	21-Oct	13-Oct	23-Oct	05-Nov	11-Nov
France	06-Sep	26-Jul	25-Jul	20-Jun	20-Jun	13-Jun	09-Jun	21-May	18-May	19-May	25-May	30-May
Germany	30-Apr	18-Apr	13-Apr	03-Jun	05-May	27-Apr	20-Apr	20-Apr	07-Apr	06-Apr	07-Apr	02-May
Greece	20-Aug	04-Sep	29-Aug	06-Aug	28-Aug	07-Aug	31-Jul	08-Aug	05-Sep	08-Dec	21-Dec	29-Dec
Hungary	-	-	02-May	19-May	26-Jun	07-Jul	02-Jul	02-Jul	16-Jul	09-Jul	20-Jul	06-Aug
Ireland	> year	> year	> year	> year	> year	> year	> year	> year	> year	> year	> year	> year
Italy	29-Jun	22-Jun	24-May	05-May	06-May	30-Apr	16-Apr	21-Apr	14-Apr	13-Apr	18-Apr	03-Apr
Latvia	-	-	> year	> year	> year	> year	> year	> year	> year	30-Aug	> year	26-Dec
Lithuania	-	-	01-Jan	30-Mar	27-Mar	12-Jun	20-May	24-May	01-Apr	24-Feb	31-Mar	03-Mar
Malta	-	-	-	-	-	-	02-Apr	08-Jan	03-May	01-Jun	30-May	24-May
Netherlands	> year	20-Nov	> year	> year	> year	> year	25-Jan	25-Jul	25-Oct	15-Aug	05-Nov	29-Dec
Poland	-	-	13-Jul	30-Jun	20-Jul	19-Jul	05-Jun	18-Jul	06-Jun	12-May	25-May	26-May
Portugal	08-Jul	20-May	16-Mar	11-Feb	02-Apr	26-Apr	20-Apr	30-Mar	29-Apr	01-May	27-Apr	20-Apr
Romania	-	-	28-Mar	14-Feb	20-Feb	28-Feb	23-Feb	23-Feb	28-Jan	14-Feb	18-Feb	22-Feb
Slovakia	-	-	27-Jan	04-Feb	07-Feb	14-Feb	06-Feb	08-Feb	27-Jan	09-Jan	07-Jan	05-Feb
Slovenia	-	-	17-Mar	06-Mar	26-Feb	27-Feb	21-Feb	06-Mar	12-Feb	23-Feb	12-Feb	05-Feb
Spain	18-Jun	26-May	28-May	06-May	10-May	08-May	15-May	25-May	16-May	11-Jun	09-May	10-May
Sweden	11-Nov	> year	> year	> year	> year	30-Dec	> year	> year	> year	29-Nov	26-Oct	27-Nov
UK	30-Jul	04-Sep	21-Aug	23-Aug	04-Aug	16-Jul	05-Aug	21-Aug	13-Sep	12-Sep	12-Sep	19-Sep

Notes: Includes Luxembourg. #Consumption for Estonia in 2013 was calculated as 2013 population multiplied by the estimate of per-capita consumption from the FAO Fishery and Aquaculture Statistics Yearbook 2010. This approach was used because under the normal methodology the consumption estimate was unrealistic - indicates that estimates could not be made, typically due to lack of data, particularly trade balances.

Overfishing these stocks imposes a severe constraint on how self-sufficient the EU and its member states can hope to be, given current levels of consumption. By imputing the potential that rebuilding stocks have to meet current consumption, and trading this off against the fish that are currently caught outside of EU waters (either imports or external catches) because domestic production is too low, we find striking results. The EU27 loses around 2 million tonnes per year from overfishing just these stocks, which if rebuilt could increase the EU27's self-sufficiency in 2013 from 0.53 to 0.77. This would delay the EU27's fish dependence day by almost three months, from 13 July to 8 October.

Table 6: Fish dependence days for the EU and its member states, excluding aquaculture from domestic supply.

	1990	1995	2000	2005	2006	2007	2008	2009	2010	2011	2012	2013
EU27	-	-	14-Jul	03-Jul	14-Jun	07-Jun	11-Jun	11-Jun	13-Jun	25-May	15-May	27-May
Austria	04-Jan	03-Jan	04-Jan	02-Jan	02-Jan	02-Jan	02-Jan	02-Jan	02-Jan	01-Jan	01-Jan	02-Jan
Belgium*	-	-	25-Feb	19-Mar	15-Apr	16-Mar	01-Mar	18-Feb	17-Feb	16-Feb	13-Feb	23-Feb
Bulgaria	-	-	22-Apr	01-Mar	16-Mar	23-Apr	29-Mar	31-Mar	24-Apr	04-Apr	27-Mar	27-Mar
Cyprus	-	-	25-Oct	24-Jan	12-Feb	10-Feb	28-Jan	25-Jan	25-Jan	26-Jan	31-Jan	29-Jan
Czech Republic	-	-	30-Jan	27-Jan	03-Feb	30-Jan	26-Jan	26-Jan	30-Jan	01-Jan	02-Jan	25-Jan
Denmark	> year	> year	31-Dec	13-Nov	13-Oct	10-Aug	26-Sep	30-Oct	15-Sep	13-Dec	> year	> year
Estonia	-	-	> year	> year	> year	> year	> year	> year	> year	> year	> year	> year
Finland	11-Jul	14-Aug	06-Sep	24-Aug	29-Aug	24-Sep	08-Oct	16-Oct	08-Oct	29-Sep	04-Nov	14-Oct
France	22-Jun	19-Jun	21-Jun	14-May	15-May	07-May	28-Apr	08-Apr	06-Apr	02-Apr	02-Apr	12-Apr
Germany	09-Apr	31-Mar	24-Mar	21-May	25-Apr	13-Apr	04-Apr	04-Apr	24-Mar	17-Mar	17-Mar	18-Apr
Greece	03-Aug	18-Jul	27-Jun	23-May	15-Jun	22-May	11-May	12-May	31-May	23-Apr	24-Apr	29-Apr
Hungary	-	-	24-Feb	07-Mar	29-Mar	31-Mar	01-Apr	28-Mar	25-Mar	01-Jan	13-Jan	07-Mar
Ireland	> year	> year	> year	> year	> year	> year	> year	> year	> year	> year	29-Nov	> year
Italy	03-May	12-May	06-Apr	27-Mar	30-Mar	23-Mar	09-Mar	14-Mar	09-Mar	24-Feb	27-Feb	16-Feb
Latvia	-	-	> year	> year	> year	> year	> year	> year	> year	29-Aug	> year	22-Dec
Lithuania	-	-	01-Jan	27-Mar	23-Mar	09-Jun	17-May	19-May	26-Mar	16-Feb	17-Mar	16-Feb
Malta	-	-	-	-	-	-	19-Jan	02-Jan	04-Feb	18-Feb	04-Feb	30-Jan
Netherlands	>1 year	13-Nov	>1 year	>1 year	>1 year	>1 year	29-Jan	10-Jul	10-Oct	11-Jul	25-Sep	11-Nov
Poland	-	-	30-Jun	07-Jun	27-May	27-Jun	13-May	03-Jul	18-May	17-Apr	24-Apr	27-Apr
Portugal	04-Jul	18-May	22-Mar	09-Feb	10-Apr	23-Apr	17-Apr	27-Mar	25-Apr	24-Apr	18-Apr	13-Apr
Romania	-	-	13-Feb	22-Jan	24-Jan	25-Jan	19-Jan	15-Jan	11-Jan	03-Jan	04-Jan	08-Jan
Slovakia	-	-	17-Jan	23-Jan	23-Jan	29-Jan	23-Jan	28-Jan	19-Jan	01-Jan	n/a	22-Jan
Slovenia	-	-	20-Feb	04-Feb	29-Jan	29-Jan	23-Jan	28-Jan	25-Jan	19-Jan	03-Jan	07-Jan
Spain	01-May	27-Apr	18-Apr	30-Mar	25-Mar	24-Mar	08-Apr	10-Apr	03-Apr	10-Apr	05-Mar	20-Mar
Sweden	31-Oct	>1 year	>1 year	>1 year	>1 year	30-Dec	> year	> year	> year	06-Nov	01-Oct	04-Nov
UK	17-Sep	26-Aug	05-Aug	03-Aug	13-Jul	22-Jun	11-Jul	26-Jul	19-Aug	07-Jul	08-Jul	13-Jul

Source: Data used were Eurostat data or national data, where available. Aquaculture was excluded from production but included in the trade data. Notes: *Includes Luxembourg. #Consumption for Estonia in 2013 was calculated as 2013 population multiplied by the estimate of per-capita consumption from the FAO Fishery and Aquaculture Statistics Yearbook 2010. This approach was used because under the normal methodology the consumption estimate was unrealistic - indicates that estimates could not be made, typically due to lack of data, particularly trade balances.



However, the picture for member states is more varied. Rebuilding these 43 stocks would make the UK, Denmark, Sweden and Finland entirely self-sufficient. Other countries that stand to gain substantially include: Germany, which could potentially become fish dependent more than three months later (2 May July versus 9 August); Belgium also more than two months later (11 May versus 23 February), France more than two months later (11 August versus 30 May), Poland 65 days later (30 July versus 24 May), and Spain 51 days later (30 June July versus 10 May). These results can be seen in Table 7. It is important to bear in mind that these results are not exhaustive estimates of the costs of overfishing. For example, while stocks and catches in the Mediterranean have declined substantially in the last few decades, the costs of overfishing to Greece and Italy are zero and relatively small for Spain because none of the 43 stocks studied are in the Mediterranean.

Table 7: Comparison of fish dependence days for selected EU member states with and without overfishing.

	With overfishing (2013)	Without overfishing (2013)	Difference (days)
EU27	13-Jul	08-Oct	87
Belgium*	23-Feb	11-May	77
Denmark	> year	> year	221
Finland	11-Nov	> year	231
France	30-May	11-Aug	73
Germany	02-May	09-Aug	99
Lithuania	03-Mar	26-Apr	54
Netherlands	29-Dec	19-Jan	151
Poland	26-May	30-Jul	65
Portugal	20-Apr	12-May	22
Spain	10-May	30-Jun	51
Sweden	27-Nov	> year	377
UK	19-Sep	> year	87

Source: Data used were Eurostat data, or national data (where available), and aquaculture was excluded from production but included in the trade data. Notes: *Includes Luxembourg. Difference days have been rounded.

Discussion and implications

Fish dependence is a powerful concept that illustrates how far overconsumption outstrips domestic resources.

As we have shown, one way to demonstrate this trend is to represent a country's degree of self-sufficiency as a calendar day – the day in the year when a country has consumed its own supply and must begin sourcing its products elsewhere, hence the term 'fish dependence day'. For the EU, this date is currently 11 July, after which the EU depends on foreign resources (or 25 May if we do not include domestic aquaculture in our calculations).

Interpretation of results

Many factors affect a country's degree of self-sufficiency. These include the size of the fleet, fish catch, external catch relative to total catch, area and productivity of national waters, fish consumption per capita, the scale of imports and exports, and domestic aquaculture production.

Naturally, landlocked countries or those with small fleets (relative to consumption demand) will have a lower degree of self-sufficiency. Those nations with high levels of fish consumption and substantial external fishing, such as Spain and Portugal, reach their fish dependence days earlier in the year. Others with a higher proportion of catches in EU waters and lower levels of consumption, such as Denmark, have a dependence date later in the year. Some EU countries, such as Ireland and Estonia, are actually self-sufficient.

Aquaculture increases fish production and therefore improves self-sufficiency levels. But this is only the case when it results in a net gain in production; for example, if fish outputs are bigger than fish inputs (i.e. fishmeal). This is not always the case, as we have seen with carnivorous species. Our results show that the inclusion of aquaculture delays the date of fish dependence by almost two months. But overall, aquaculture production has not altered the trend of increasing EU fish dependence.

The EU is naturally endowed with potentially rich and productive seas and it has the capacity to significantly increase its self-sufficiency levels both by managing its marine ecosystems in a sustainable way and by changing its consumption patterns. It is therefore important to emphasise that the trends found here are not an unavoidable problem, rather the consequence of previous overcapacity in EU fishing fleets and

poor management of EU fish resources and unsustainable consumption patterns. As the stock situation is beginning to turn around, so too can our dependence on fish from elsewhere.

Fish dependence and sustainability

It is worth highlighting that the degree of self-sufficiency we have calculated is not a direct commentary on the sustainability of fisheries. For example, according to our results, the Netherlands was a self-sufficient country until 2009, but this does not mean that it has fished sustainably in its own waters until now. Indeed, our estimates⁸⁹ for the costs of overfishing show that the Netherlands stands to benefit from an extra 119 days of self-sufficiency from rebuilding these stocks. However, the sustainability of a country's fisheries is not directly investigated in this report. A direct commentary on sustainability requires detailed knowledge of the carrying capacities of all species and stocks, while our estimates⁹⁰ concern only 43 of more than 150 European stocks, and none in the Mediterranean.

Despite this, we believe there is substantial evidence to suggest that increasing dependence on other countries over the long term is a powerful indicator of unsustainable fisheries and overexploitation of EU resources. Our self-sufficiency ratios are an easy-to-understand way of highlighting the impact that the EU's increasing fish dependence is having on other countries.

Ultimately, our results are consistent with other evidence on the effects of unsustainable trends in global fisheries.

Implications of the EU's fish dependence

Food security in developing countries

The interdependence of countries is becoming increasingly complex, not least in the food market.^{91,92} A significant proportion of EU fish imports come from developing countries. At a global level, half of the US\$92 billion worth of fish products traded in 2007 came from developing countries.⁹³ The fish-product trade is more valuable to developing countries than those of tea, rice, cocoa, and coffee combined.⁹⁴ It is clear, therefore, that notions of self-sufficiency directly impact the interdependence and patterns of global trade.

But while there are potentially large economic benefits from trade, the current rules of the game are not necessarily working for poorer countries. It is challenging for developing countries to get higher returns on their resources. Trade fuels economic development in the exporting countries and revenues from fish exports may, potentially, help combat hunger in these countries.⁹⁵ But trade can lead to problems of food insecurity, largely because fish is a major source of protein in developing countries.⁹⁶

The emergent picture is non-uniform across and within countries. In at least some cases, the net effects of the fish trade are completely unclear, showing neither decreased food security nor economic development.

That said, there are other cases where the outcomes of trade are clearer. While fish for export are generally different, higher-value species than those consumed locally, there is evidence that in some cases fish supply is being diverted away from vulnerable people in developing countries. For example, in the decade from 1978/80 to 1988/90, per capita fish consumption in developed regions increased (by 27.7% in North and Central America and 23% in Europe and Asia), while in developing regions it fell (by 2.9% in Africa, 7.9% in South America, and more than 25% in at least 24 countries, including Burundi, Libya, Mali, Costa Rica, and Colombia).⁹⁷ Moreover, there is worrying evidence that this decline is not being offset by other forms of animal protein,⁹⁸ despite the region potentially benefiting economically from trade. How this diversion occurs is not straightforward; it may be due to a combination of local people and exporters targeting the same species, or the knock-on effect of the exploitation of particular but exclusive stocks.

In summary, in order to combat cases of unsustainable trade that unfairly damage developing countries, trade regimes need to be more environmentally and socially aware.^{99, 100, 101} The positive macroeconomic impact of exporting fish products and natural resources must be used to drive development, yet also weighed against the potential negative consequences for those who depend on those resources in poor communities. Consumption within sustainable limits is an important component of any positive trade. The EU, for the sake of its own food security, employment, and ecological health, must replenish its own fish stocks, with any excess demand being satisfied by well-regulated and mutually beneficial trade with developing countries.

Vulnerability of the EU fishing industry

There is still a large gap between fish supply and demand within Europe as a consequence of overfished stocks. This is putting jobs in the domestic fishing industry at risk and also undermining the processing industry that depends on fisheries. The prospect of further increases in fuel price can only exacerbate this trend. Fuel is currently subsidised in many countries, and this is often essential if fishing operations are to be economically viable. Such subsidies will be more difficult to justify and maintain, however, as climate change and rising oil prices begin to make an impact and the pressure to cut carbon emissions intensifies. For example, the increasing dependence of the EU processing industry on imports is pushing up societal and environmental costs such as climate change impacts and environmental damage.

In order to maintain competitiveness with non-EU producers and processors, the EU fishing industry must use its resources more efficiently.

Undersupply for the growing European market is not likely to be a problem in the immediate future. The average fish price in European markets is higher than anywhere else in the world except Japan, which

Photo: Corey Arnold



makes Europe a lucrative and attractive market for exporters. In the long-term, however, unless we start improving the productivity of EU waters, the prospects for the EU fishing industry look bleak.

Some companies, such as the Spanish-based companies Pescanova (which recently filed for bankruptcy) and Calvo responded to shortages in EU fish stocks by sourcing fish directly through their own fleet or through joint ventures in developing countries.¹⁰² While this is a natural response to a challenging economic environment from a business strategy point of view, it only serves to increase our dependence on fish from elsewhere.

The way forward and opportunities for change

There are many benefits associated with replenishing fish stocks. A high degree of self-sufficiency helps to deliver increased food security, improved resource management, a healthier environment, and long-term employment and social stability for fishing communities. A decrease in the degree of self-sufficiency means the opposite, which is why the EU's fish resources and fisheries sector are both in such a parlous state.

This situation is reversible, however. The current state of EU fisheries must be set against a backdrop of once rich and productive EU waters of considerable economic and cultural significance.^{103,104,105} We need to moderate current levels of fish consumption and restore EU fish stocks, both of which would reverse our increasing levels of fish dependence.

The new EU Common Fisheries Policy

Before the recent reform of the EU Common Fisheries Policy (CFP) in 2013, it was been widely recognised that the CFP had failed to deliver

on its central objective – the sustainable exploitation of living aquatic resources.¹⁰⁶ However, the reform of the CFP, involving negotiations between the European institutions (European Parliament, the European Commission, and all 27 EU member States) and campaigning by a diverse group of stakeholders, has led to commitments to sustainable fishing and addressed the majority of the previous shortcomings.

In December 2013, a new CFP was approved, which represents a huge step forwards for fish stocks and the communities dependent on them.

The new policy, which applies throughout EU waters and to the EU fleet globally (as of 1st January 2014), has laid the foundation for sustainable fisheries management in the EU and if properly implemented will lead to all EU fish stocks being fished at MSY by 2020 and discard-free fisheries.

The policy also requires member states to be transparent and take social and environmental criteria into account when allocating fishing opportunities, rather than just allocating based on historic track record. This point opens up the possibility for the development and implementation of new criteria that ensure fishing opportunities and funding are targeted to those segments of the fleet that deliver highest value to society. There are numerous studies which give an insight of how this could be done.¹⁰⁷

The new CFP is supported by the European Maritime and Fisheries Fund (EMFF) with a total of €6.5 billion available to 2020. The new EMFF contains some positive measures, such as more funding to enhance data collection and improve control and enforcement and also to support fishing communities in the transition to sustainable fisheries. The need for better data collection is particularly relevant, especially in the Mediterranean and Black Sea where around 80% of landings come from stocks which are data deficient.¹⁰⁸ However, for the EU overall the trend is positive. By 2014, the number of MSY assessed stocks reached 35 in 2009 and 46 by 2014; at the same time stocks with quantitative advice have also increased from 59 in 2003 to 71 stocks in 2014.¹⁰⁹

Yet, the new EMFF still includes funding for measures which could lead to overfishing such as subsidies for fishing vessel engine replacing replacement, which may contribute to overcapacity.

An ambitious and effective implementation of the new Common Fisheries Policy, with a good use of the EMFF opportunities, can deliver sustainable management of fish stocks in Europe. Now it is up to member states, EU institutions and the fishing industry to make the most of it and translate the potential of more food, jobs and profits into a reality. EU citizens, meanwhile, need to exercise their consumer power to move towards patterns of consumption that match what our oceans are able to produce.

Conclusions

The EU and many of its leading member states remain highly dependent on fish resources from other countries.

This is down to two main driving factors: Many EU stocks are in poor health –below their maximum potential – and EU demand for fish remains high as EU citizens eat more fish than their waters can produce. We have seen that the EU continues to rely on foreign resources for almost half of its fish consumption; this dependence – while showing some signs of stabilisation – has increased with respect to 2000 levels, and the impact of aquaculture in reducing this trend is limited. The EU's fish dependence day is now 13 July. Certain member states, such as Spain, France, Italy, and Portugal, reach their fish dependence days much earlier than this, despite their access to productive EU waters.

We have also seen that a high dependence of aquaculture on wild-fish catches for fish meals and oils is not only making the industry less productive (when inputs tend to outweigh fish production outputs, particularly for carnivorous species), but also, as an increasingly major consumer of fish, aquaculture is putting extra pressure on already overfished stocks everywhere.

Photo: Corey Arnold



Many of the costs of EU fisheries mismanagement and historic overfishing are being exported, with direct consequences on the fish stocks of non-EU countries, to meet EU demand. Change is desperately needed if we are to break this pattern – the EU needs to focus efforts on restoring its own marine ecosystems and to move towards consumption levels that are commensurate with ecosystem capacity.

The newly reformed EU Common Fisheries Policy is an opportunity to rebuild fish stocks, to ensure these are managed in the public interest and to reduce our levels of fish dependence. Over the next years EU member states need to:

- Develop and implement ambitious long-term fisheries management plans (LTFMPs), including catch limits which lead to the restoration of EU fish stocks to their maximum sustainable yield (MSY) by 2020 at the latest;
- Develop and apply new criteria to allocate fishing opportunities and funding to those segments of the fleet that deliver best value to society;
- Promote responsible consumption levels that respect the ecological limits of the marine ecosystems; and
- Use European funds responsibly, to support fish stock restoration and support fishing communities in the transition to discard-free sustainable fishing.

All of these measures will help to reverse the EU's trend towards increased dependence on other countries' resources.

Appendix

This section includes supporting tables and data that were used in the text or calculations.

Table A1: Total fisheries production in the EU (catch + aquaculture) in tonnes live weight (1995-2013)

Member State	1995	2000	2005	2006	2007	2008	2009	2010	2011	2012	2013
EU27	9,253,885	8,187,779	6,902,605	6,733,723	6,486,666	6,428,211	6,360,739	6,216,117	6,049,528	5,609,959	5,925,782
Austria	3,322	3,286	2,790	2,863	2,889	2,440	2,492	2,517	2,909	2909	3,588
Belgium*	36,474	31,673	25,002	23,143	24,667	22,735	22,295	22,991	22,240	22240	25,377
Bulgaria	12,627	10,652	8,578	10,803	13,336	14,022	16,891	18,686	16,048	15093	20,782
Cyprus	9,772	69,360	4,267	5,725	5,425	5,788	4,767	5,506	5,830	5629	6,506
Czech Republic	22,608	24,129	24,697	25,077	24,723	24,559	24,183	24,410	21,010	21010	23,350
Denmark	2,043,638	1,577,683	949,646	895,763	684,184	727,837	811,877	860,343	793,377	536220	700,471
Estonia	132,345	113,384	100,138	87,584	100,225	101,519	98,076	95,857	78,362	63528	67,248
Finland	171,774	170,935	145,642	162,335	177,705	164,596	168,223	163,161	136,104	150731	158,342
France	956,367	969,097	839,994	831,097	795,813	737,743	668,623	667,034	680,520	666303	725,117
Germany	302,925	271,585	330,368	335,521	340,809	324,087	289,254	270,592	270,646	231919	244,517
Greece	184,361	194,762	198,461	211,286	208,266	203,769	204,735	192,010	169,423	169577	174,300
Hungary	16,674	19,987	21,270	22,229	22,946	22,394	20,537	24,513	15,509	15509	20,599
Ireland	419,110	329,228	327,660	264,968	267,527	250,217	316,292	365,069	250,467	312059	280,132
Italy	611,522	518,680	479,000	489,540	467,631	393,623	415,326	387,358	376,764	376764	313,818
Latvia	149,719	136,728	151,160	140,955	156,001	158,518	163,728	165,368	156,676	90076	116,403
Lithuania	59,082	80,985	141,726	156,775	190,874	185,766	176,117	142,983	140,373	73758	79,014
Malta	5,539	2,820	2,072	8,513	9,833	8,009	6,776	8,717	5,992	9644	11,432
Netherlands	502,596	571,005	620,578	512,093	467,011	463,369	437,655	352,228	408,684	391198	370,975
Poland	454,483	253,481	193,167	181,346	186,746	179,328	260,397	179,681	201,720	212920	228,477
Portugal	274,509	196,694	225,967	236,990	260,561	230,648	205,554	230,578	223,073	206373	202,280
Romania	69,105	17,099	13,337	15,772	16,496	17,906	17,151	7,185	8,890	10815	11,764
Slovakia	3,567	2,255	2,648	2,980	3,193	2,733	2,584	2,431	913	913	2,693
Slovenia	2,956	3,037	2,573	2,500	2,465	2,190	2,716	1,710	2,116	1484	1,232
Spain	1,392,876	1,375,722	988,019	1,038,567	1,023,023	1,171,061	1,029,290	992,654	1,072,782	1024420	1,108,562
Sweden	412,145	343,374	262,240	276,804	243,619	238,935	211,953	222,677	195,528	163876	190,155
UK	1,003,788	900,136	841,605	792,493	790,698	774,420	783,248	809,858	793,572	832,082	823,592

Source: Eurostat, European Commission. Eurostat database (epp.eurostat.ec.europa.eu/portal/page/portal/fisheries/data/database). Eurostat Pocketbook – Agriculture, forestry and fishery statistics. 2013 Edition.

Table A2: EU external catches in tonnes product weight (2000-2013)

Member State	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
EU27	1,425,747	1,453,102	1,327,485	1,237,280	1,233,664	1,184,674	1,144,539	1,087,730	1,086,920	1,064,241	1,038,194	1,012,756	917,144	996,157
Denmark	231,538	171,737	146,103	137,995	122,656	102,112	76,461	91,261	69,722	59,150	48,452	88,862	25,333	21,297
Estonia	20,788	16,355	16,597	16,000	17,374	35,540	34,336	32,632	32,608	31,927	31,146	30,383	27,514	29,885
Finland	0	0	0	81	0	0	0	0	0	0	0	0	-	-
France	116,819	116,819	116,819	116,819	116,819	116,819	116,819	116,819	116,819	116,819	116,819	111,403	100,886	109,577
Germany	29,468	28,555	27,547	26,514	24,848	35,912	35,698	82,042	96,539	70,942	58,023	84,108	49,053	24,101
Greece	0	0	0	0	0	11,847	11,445	10,877	10,869	10,642	10,382	10,128	9,171	9,962
Ireland	9,288	44,094	20,707	13,118	10,355	15,868	5,149	6,874	8,096	9,950	11,765	6,081	5,231	4,363
Italy	1,980	4,579	4,029	5,141	4,494	35,540	34,336	32,632	32,608	31,927	31,146	30,383	27,514	29,885
Latvia	3,397	3,330	2,742	29,189	26,507	47,387	45,782	43,509	43,477	42,570	41,528	81,825	36,686	52,276
Lithuania	15,176	102,734	30,524	18,010	14,193	118,467	114,454	108,773	108,692	106,424	103,819	117,733	50,977	62,333
Netherlands	16,922	49,568	15,487	35,536	59,324	44,204	59,262	73,714	84,147	66,226	50,773	126,804	43,523	18,112
Poland	58,195	36,326	26,864	16,117	19,323	23,693	22,891	21,755	21,738	33,061	20,764	64,841	59,128	61,414
Portugal	27,166	28,496	31,822	33,828	27,351	94,774	91,563	87,018	86,954	85,139	83,056	81,020	73,372	79,693
Spain	576,011	591,759	459,887	462,754	417,120	414,690	401,585	398,542	496,139	410,792	398,990	355,094	495,258	537,925
Sweden	31,337	24,634	39,757	76,474	34,814	51,418	54,333	7,816	6,838	5,971	0	2,250	710	849
UK	31,907	30,713	23,866	26,796	23,886	23,693	28,738	30,737	36,110	38,675	43,630	38,342	40,508	26,595

Source: Study on the European External Fleet (2008) (Contract FISH/2006/02) © European Communities. Eurostat, European Commission. Eurostat database (epp.eurostat.ec.europa.eu/portal/page/portal/page/portal/fisheries/data/database).

Table A3: Trade Balance (exports minus imports) in tonnes product weight (1995-2013)

Member State	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
EU27*	-3,473,420	-3,512,615	-3,496,412	-3,863,059	-3,450,097	-3,714,624	-4,103,370	-4,276,001	-4,012,273	-4,007,893	-3,789,931	-3,682,470	-3,383,954	-3,443,526
Austria	-50,896	-53,532	-50,340	-53,697	-61,384	-68,630	-67,300	-72,135	-68,280	-65,813	-66,723	-63,266	-64,038	-67,763
Belgium	-164,870	-135,352	-134,721	-140,864	-146,917	-91,388	-55,376	-95,076	-114,694	-140,590	-150,062	-153,821	-148,097	-147,777
Bulgaria	-15,934	-17,941	-17,777	-22,930	-23,258	-27,896	-29,526	-19,821	-27,611	-27,828	-23,998	-19,057	-19,197	-20,149
Cyprus	-15,310	-17,450	-16,231	-16,941	-20,267	-26,934	-15,965	-18,364	-24,631	-19,285	-19,546	-10,973	-10,055	-8,321
Czech Republic	-52,692	-54,728	-49,453	-48,258	-52,929	-54,090	-45,914	-51,020	-55,061	-54,905	-45,059	-37,011	-41,484	-35,185
Denmark	-1,178	16,410	-179,969	-419,503	-158,631	-167,658	-219,909	-385,273	-150,145	-89,608	-277,748	84,007	88,676	142,474
Estonia	47,779	98,070	86,099	7,476	63,492	90,824	83,994	73,120	73,007	82,378	96,050	76,337	61,232	52,275
Finland	-73,669	-90,123	-84,261	-82,673	-83,505	-72,422	-77,023	-60,918	-45,049	-40,951	-45,487	-31,998	-27,079	-25,427
France	-543,271	-618,728	-623,014	-593,755	-648,241	-712,905	-698,654	-715,732	-677,611	-769,758	-798,478	-819,898	-749,336	-777,447
Germany	-601,508	-525,041	-558,205	-526,061	-463,031	-400,098	-429,771	-510,195	-430,004	-521,188	-530,523	-443,015	-450,046	-417,939
Greece	-79,800	-110,206	-122,784	-95,156	-77,953	-117,481	-90,990	-121,889	-127,089	-117,750	-75,619	-857	4,963	8,854
Hungary	-41,692	-48,818	-46,779	-39,422	-30,162	-35,173	-25,128	-21,768	-22,256	-20,580	-20,999	-14,421	-12,551	-13,928
Ireland	152,964	212,351	223,396	197,110	208,137	154,195	118,334	96,702	116,633	105,389	137,709	127,840	170,586	175,664
Italy	-696,826	-762,164	-747,941	-792,388	-804,953	-833,740	-841,081	-856,909	-845,278	-855,954	-865,868	-854,070	-799,179	-812,585
Latvia	61,472	85,338	81,548	73,595	65,071	75,865	76,277	71,708	68,957	56,354	61,280	43,753	53,192	51,278
Lithuania	-43,219	-45,265	-21,018	-5,713	-10,107	-2,933	-1,695	4,553	-14,269	-1,710	-14,413	-10,368	-18,089	-19,628
Malta	-15,029	-20,313	-14,191	-27,636	-18,616	-15,572	-25,230	-35,484	-23,594	-303,874	-17,338	-8,414	-13,820	-17,646
Netherlands	12,427	30,102	42,717	120,780	312,953	259,998	194,608	103,116	109,289	-222,667	-17,953	-44,876	-19,251	15,920
Poland	-182,600	-168,028	-135,174	-142,579	-150,848	-154,013	-145,659	-116,188	-188,313	-156,670	-191,836	-177,560	-173,030	-190,887
Portugal	-239,920	-249,865	-237,871	-254,338	-231,553	-968,838	-275,977	-289,961	-242,871	-289,394	-222,989	-205,796	-207,902	-208,046
Romania	-55,138	-64,559	-77,059	-73,416	-84,465	-96,314	-98,823	-86,334	-103,387	-100,104	-87,894	-64,043	-69,829	-69,897
Slovakia	-21,033	-21,629	-21,217	-20,105	-26,271	-25,359	-23,822	-23,184	-24,612	-21,721	-30,986	-37,372	-50,947	-24,807
Slovenia	-11,603	-13,304	-12,247	-11,402	-12,041	-11,771	-13,563	-13,073	-13,226	-12,644	-12,872	-12,263	-11,361	-11,467
Spain	-602,475	-651,936	-666,633	-772,470	-723,247	-680,926	-759,318	-764,351	-653,336	-528,691	-608,345	-548,890	-464,103	-497,836
Sweden	98,479	73,817	42,189	22,186	23,177	23,265	67,756	1,879	11,364	24,011	48,455	-16,841	-34,954	-18,635
UK	-472,032	-533,195	-471,262	-396,764	-414,947	-433,763	-506,695	-405,264	-465,686	-384,133	-284,469	-289,147	-299,047	-290,355

Source: Study on the European External Fleet (2008) (Contract FISH/2006/02) © European Communities. Eurostat. European Commission. Eurostat database (epp.eurostat.ec.europa.eu/portal/page/portal/fisheries/data/database).

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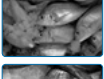



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Fish dependence day calendar 2016

JAN		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
FEB		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28			
MAR		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
APR		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
MAY		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
JUN		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
JUL		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
AUG		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
SEP		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
OCT		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
NOV		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
DEC		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31

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If you have any feedback, comments or suggestions to improve this report we would love to hear from you.
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